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Questions:

Long Answer Type Questions

1. Explore how 5G can impact society.
2. How is IP address different from MAC address? Discuss briefly.

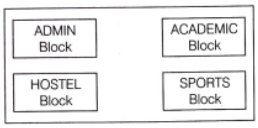
Short Answer Type Questions

3. Do mobile phones have a MAC address? Is it different from the IMEI number of mobile phones?
4. List various types of senders on a network.
5. Mention any two main advantages of using a network of computing devices.
6. What is the significance of MAC address?
7. Compare wired and wireless media.
8. Write short note on the following:
   (a) Bandwidth
   (b) Data transfer rate
   (c) Bluetooth
9. What is a protocol in data communication? Explain with an example.
10. A composite signal contains frequencies between 500 MHz and 1GHz. What is the bandwidth of a signal?
11. Differentiate between wired and wireless transmission.
12. In twisted pair cable, two insulated wires are twisted around each other which provides protection against noise. Explain.
13. Write two advantages of using an optical fibre cable over an ethernet cable to connect two service stations, which are 190 m away from each other.
14. What is protocol? Which protocol is used to copy a file from/to a remote server?
15. (a) Write the full forms of the following
    (i) IP (ii) TCP
    (b) What is the need of protocols?
16. Out of the following, which is the fastest wired and wireless medium of transmission?
    Infrared, Coaxial cable, Optical fibre, Microwave, Ethernet cable
17. Expand the term SMTP. What is the use of SMTP?
18. What is VoIP?
19. How packet switching different from circuit switching?
20. Explain wireless technology and give a brief note on the following
    (a) Bluetooth (b) Radiowave

Case Study Questions

21. A small company, "Creative Designs," has been experiencing consistently slow internet speeds in their office. They have several computers connected to a wireless router provided by their Internet service provider (ISP).
    They primarily use the internet for web browsing, sending emails with attachments, and occasionally uploading large design files to a cloud storage service. Employees have been complaining about the time it takes to load web pages and the frequent delays in sending and receiving emails.
    (i) What is the most probable cause of slow internet speeds experienced by multiple users connected to the same wireless router in the office?
    (A) Problems with the physical wiring outside the office building.
    (B) Inefficient routing protocols used by the ISP.
    (C) Overcrowding of the wireless channel or interference from other devices.
    (D) Incorrect IP address configurations on the individual computers.
    (ii) If Creative Designs frequently uploads large design files, which factor related to their internet connection would most directly impact the time it takes for these uploads?
    (A) The type of web browser used by the employees.
    (B) The upload speed provided by their internet service plan.
    (C) The domain name of their cloud storage service.
    (D) The type of email client software they are using.
    (iii) The office uses email extensively, often with attachments. Which network protocol is primarily responsible for sending these emails from their Computers?
    (A) HTTP
    (B) FTP
    (C) SMTP
    (D) POP3
    (iv) If some employees are closer to the wireless router and experience faster speeds than those further away, what could be a contributing factor to this difference?
    (A) The IP addresses assigned to the closer computers are prioritized.
    (B) The wired connection to the ISP is experiencing intermittent issues.
    (C) The signal strength of the wireless network weakens with distance.
    (D) The web servers of the websites they are visiting are located further away.
    (v) Creative Designs' ISP provided a wireless router. What is the primary function of this router in their local network?
    (A) To store all the company's files and applications.
    (B) To translate domain names into IP addresses.
    (C) To facilitate communication between the computers on the local network and provide access to the internet.
    (D) To manage the email accounts of all the employees.
22. Sanjeevani is a big group of educational institutions with its head office in Hyderabad. It is planning to set up a new University in Amritsar. The Amritsar University Campus will have four blocks/buildings ADMIN, ACADEMIC, HOSTEL, SPORTS. You, as a network expert, need to suggest the best network-related solutions for them to resolve the issues/problems mentioned in points (i) to (v), keeping in mind the distances between various blocks/buildings and other given parameters.

Amritsar University Campus



Block to Block distances (in Mtrs.)

FROM	TO	DISTANCE
ADMIN	ACADEMIC	60 M
ADMIN	HOSTEL	160 M
ADMIN	SPORTS	80 M
ACADEMIC	HOSTEL	40 M
ACADEMIC	SPORTS	120 M
HOSTEL	SPORTS	150 M

Distance of Hyderabad Head Office from Amritsar University Campus = 2000 km.
Number of computers in each block is as follows:

ADMIN	25
ACADEMIC	600
HOSTEL	120
SPORTS	50

(i) Suggest the most appropriate location of the server inside the Amritsar University Campus. Justify your choice.
(ii) Draw the cable layout to efficiently connect various blocks within the Amritsar University Campus.
(iii) Name any two wired media that can be used to connect various computers of a block inside Amritsar Campus.
(iv) For the academic purpose, the University will provide its own 24 × 7 FM channel within the University Campus. Which communication medium, out of the following, is used by FM?
(A) Radio Waves
(B) Micro Waves
(C) Infrared Waves
(v) (a) The students will be attending a lot of and online academic sessions workshops. These will involve audio-visual communication. Write the full name of the protocol which will be used for such a communication through the internet.
Or (b) Where should a repeater be installed in Amritsar University campus to boost the signal between blocks? Justify your answer.

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